System x3250 M5

Lenovo Press Product Guide

The System x3250 M5 single-socket 1U rack server is designed for small businesses and first-time server buyers looking for a solution to improve business efficiency. It delivers several innovative features in a compact 1U form factor with a competitive price. The System x3250 M5 provides next-generation performance in an innovative and compact design with flexible configuration options, built-in security, and systems management capabilities. It leverages the next-generation quad-core Intel Xeon processor E3-1200 v3 product family technology.

Suggested use: Small-to-medium businesses looking for file and printer servers, web serving, and small business infrastructure.

The following figure shows the System x3250 M5.

Figure 1. The System x3250 M5

Did you know

The x3250 M5 offers a flexible and scalable design and a simple upgrade path to eight HDDs plus an optical drive at the same time. The flexible onboard Ethernet solution provides two standard integrated Gigabit Ethernet ports and two additional integrated Gigabit Ethernet ports with an optional software feature for an on-demand upgrade without a need to buy additional hardware. Comprehensive systems management tools with the next-generation Integrated Management Module II (IMM2) make it easy to deploy, integrate, service, and manage.

The x3250 M5 includes features not typically seen in this class of system, such as standard RAID-0, 1, and 10 with the ServeRAID C100 for simple-swap SATA models, remote control capabilities even when the machine is powered off, and basic light path diagnostics on processor, memory, and hard drives. This flexible 1U rack-mountable server is also highly upgradable and expandable, scaling from low-cost, fixed-function models to feature-rich, highly available models.

Key features

The System x3250 M5 server is a compact, cost-effective, single-processor 1U rack server that has been optimized to provide outstanding availability, manageability, and performance features to small-to-medium-sized businesses, retail stores, or distributed enterprises.

Scalability and performance

The x3250 M5 offers numerous features to boost performance, improve scalability, and reduce costs:

- The Intel Xeon processor E3-1200 v3 product family improves productivity by offering affordable single-socket system performance with four-core processors with up to 3.6 GHz core speeds, up to 8 MB of L3 cache.
- Choice of processors with up to four cores to enable the effective use of multithreaded applications.
- Intelligent and adaptive system performance with Intel Turbo Boost Technology 2.0 allows processor cores to run at maximum speeds during peak workloads by temporarily going beyond processor thermal design power (TDP).
- Intel Hyper-Threading Technology boosts performance for multithreaded applications by enabling simultaneous multithreading within each processor core, up to two threads per core.
- Intel Virtualization Technology integrates hardware-level virtualization hooks that allow operating system vendors to better use the hardware for virtualization workloads.
- Intel Advanced Vector Extensions (AVX) significantly improve floating point performance for compute-intensive technical and scientific applications.
- The four 1600 MHz DDR3 ECC memory UDIMMs provide speed, high availability, and a memory capacity of up to 32 GB.
- The server offers up to four integrated Gigabit Ethernet ports with a convenient Lenovo Features on Demand (FoD) upgrade process that does not require the purchase of additional hardware.
- The server offers PCI Express 3.0 I/O expansion capabilities that improve the theoretical maximum bandwidth by almost 100% (8 GTps per link using 128b/130b encoding) compared to the PCI Express 2.0 (5 GTps per link using 8b/10b encoding).
- With Intel Integrated I/O Technology, the PCI Express 3.0 controller is integrated into the Intel Xeon processor E3-1200 v3 product family. Such integration reduces I/O latency and increases overall system performance.
- Up to eight 2.5-inch hot-swap or simple-swap drive bays or four 3.5-inch hot-swap or simple-swap drive bays provide maximum internal storage capacity in a compact 1U form factor.
- The use of solid-state drives (SSDs) instead of, or along with, traditional spinning drives (hard disk drives or HDDs) can significantly improve I/O performance. An SSD can support up to 100 times more I/O operations per second (IOPS) than a typical HDD.

Availability and serviceability

The x3250 M5 provides many features to simplify serviceability and increase system uptime:

- ECC memory provides error correction not available in PC-class "servers" that use parity memory. Avoiding system crashes (and data loss) due to soft memory errors can mean greater system uptime.
- Tool-less cover removal provides easy access to upgrades and serviceable parts, such as processor, memory, and adapter cards.
- The server offers simple-swap or hot-swap drives with support for an affordable ServeRAID or advanced hardware RAID redundancy for data protection and greater system uptime.

- Solid-state drives (SSDs) offer significantly better reliability than traditional mechanical HDDs for greater uptime.
- The server offers two redundant hot-swap power supplies and five redundant non-hot-swap fans to provide cost-efficient availability for applications.
- Basic light path diagnostics detects when system components (processors, memory, and hard disk drives) operate outside of standard thresholds and generates proactive alerts in advance of possible failures, therefore increasing uptime.
- Built-in Integrated Management Module II (IMM2) continuously monitors system parameters, triggers alerts, and performs recovery actions in case of failure, to minimize downtime.
- Built-in diagnostics using Dynamic Systems Analysis (DSA) Preboot speed up troubleshooting tasks to reduce service time.
- Three-year customer replaceable unit and onsite limited warranty, next business day 9x5. Optional service upgrades are available.

Manageability and security

Powerful systems management features simplify local and remote management of the x3250 M5:

- The server includes an Integrated Management Module II (IMM2) to monitor server availability and perform remote management.
- An integrated industry-standard Unified Extensible Firmware Interface (UEFI) enables improved setup, configuration, and updates, and simplifies error handling.
- Predictive Failure Analysis (PFA) alerts on memory, SAS/SATA hard disk drives, fans, power supplies, and temperature
- Integrated Trusted Platform Module (TPM) support enables advanced cryptographic functionality, such as digital signatures and remote attestation.
- Industry-standard Advanced Encryption Standard (AES) New Instructions (AES-NI) support provides faster and stronger encryption.
- Intel Execute Disable Bit functionality can help prevent certain classes of malicious buffer overflow attacks when combined with a supporting operating system.
- Intel Trusted Execution Technology provides enhanced security through hardware-based resistance to malicious software attacks, allowing an application to run in its own isolated space protected from all other software running on a system.
- IBM Systems Director provides proactive systems management. It offers comprehensive systems management tools that increase uptime, reduce costs, and improve productivity through advanced server management capabilities.

Energy efficiency

The x3250 M5 offers the following energy-efficiency features to save energy, reduce operational costs, increase energy availability, and contribute to a green environment:

- Energy-efficient planar components help lower operational costs.
- Energy Star 2.0 compliant. For the Power and Performance Data Sheet, see http://ibm.com/systems/x/hardware/energy-star
- 80 PLUS certified power supplies enable greater energy savings while providing flexibility to meet your business needs.

- The optional thermal enhancement option kit allows the use of x3250 M5 servers in environments with temperature limits extended to 40 degrees C. It also helps lower fan speeds depending on the environment's temperature to lower acoustic noise and energy use.
- The Intel Xeon processor E3-1200 v3 product family offers better performance over the previous generation, while fitting into the same TDP limits.
- Intel Intelligent Power Capability powers individual processor elements on and off as needed, to reduce power draw.
- Low-voltage Intel Xeon processors draw less energy to satisfy the demands of power and thermally constrained data centers and telecommunication environments.
- Low-voltage 1.35 V DDR3 memory UDIMMs consume up to 19% less energy compared to 1.5 V DDR3 UDIMMs.
- Solid-state drives may consume as much as 80% less power than traditional spinning 2.5-inch HDDs.
- The server uses hexagonal ventilation holes, a part of Calibrated Vectored Cooling™ technology. Hexagonal holes can be grouped more densely than round holes, providing more efficient airflow through the system.

Locations of key components and connectors

The following figure shows the front of the server with eight 2.5-inch hot-swap drive bays (models with 2.5-inch simple-swap or 3.5-inch simple-swap or hot-swap drive bays are also available).

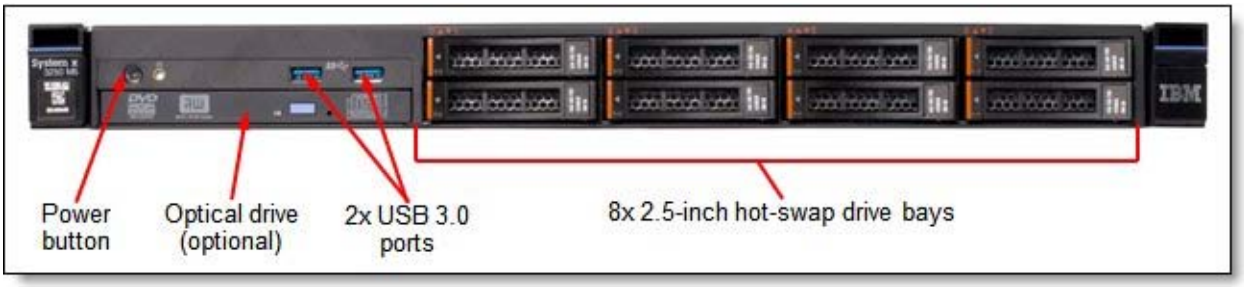

Figure 2. Front view of the System x3250 M5 with eight 2.5-inch hot-swap drive bays

The following figure shows the rear of the server with redundant hot-swap power supplies (models with fixed power supply are also available).

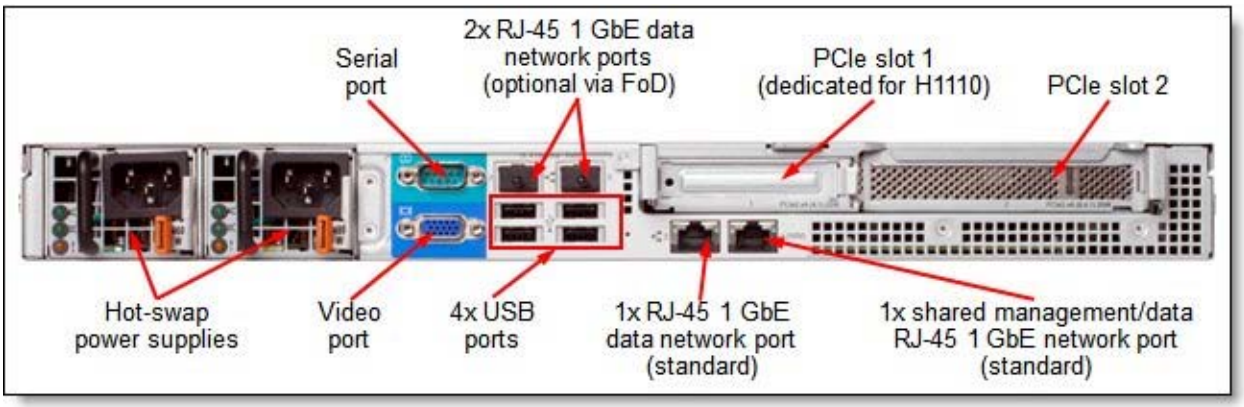
Serial port
2x RJ-45 1 GbE data network ports (optional via FoD)
PCIe slot 1 (dedicated for H1110)
PCIe slot 2
Hot-swap power supplies
Video port
4x USB ports
1x RJ-45 1 GbE data network port (standard)
1x shared management/data RJ-45 1 GbE network port (standard)

Figure 3. Rear view of the System x3250 M5 with hot-swap power supplies

The following figure shows the locations of key components inside the server.

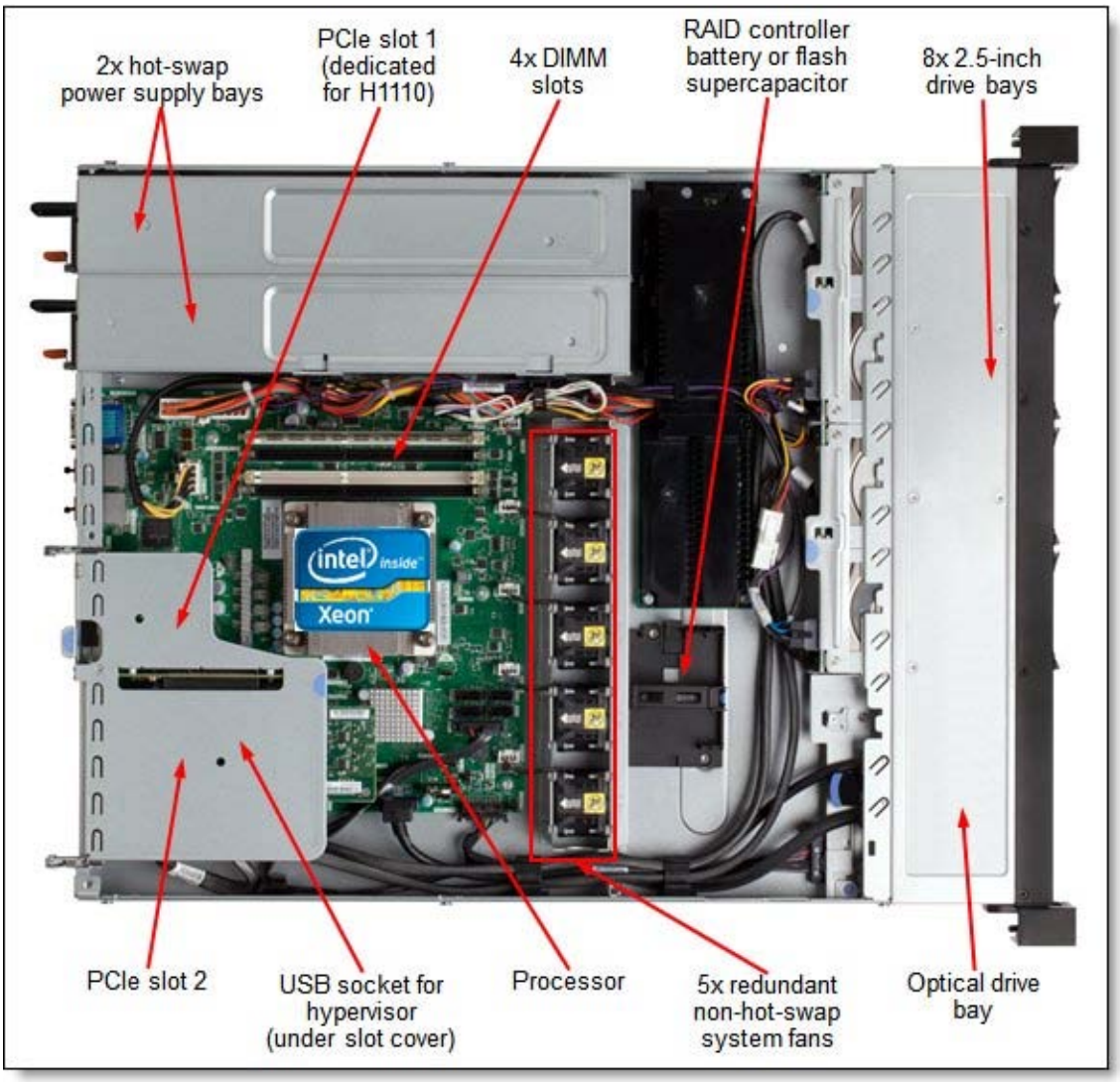
2x hot-swap power supply bays
PCIe slot 1 (dedicated for H1110)
4x DIMM slots
RAID controller battery or flash supercapacitor
8x 2.5-inch drive bays
PCIe slot 2
USB socket for hypervisor (under slot cover)
Processor
5x redundant non-hot-swap system fans
Optical drive bay

Figure 4. Inside view of the System x3250 M5

Standard specifications

The following table lists the standard specifications.

Table 1. Standard specifications (part 1)

Components	Specification
Form factor	1U rack.
Processor	One Intel Xeon processor E3-1200 v3 product family with four cores up to 3.7 GHz, up to 1600 MHz memory speed, 8 MB L3 cache; or one Intel Core-i3 processor 4100/4300 product families with two cores up to 3.7 GHz, up to 4 MB L3 cache, and 1600 MHz memory speed (CTO only); or one Intel Pentium processor G3200/G3400 product families with two cores up to 3.4 GHz, 3 MB L3 cache, and up to 1600 MHz memory speed.
Chipset	Intel C226.
Memory	Four dual inline memory module (DIMM) sockets. Support for UDIMMs. DIMM speeds up to 1600 MHz.
Memory maximums	Up to 32 GB with 4x 8 GB UDIMMs.
Memory protection	ECC
Disk drive bays	Up to eight 2.5-inch hot-swap SAS/SATA drive bays, up to eight 2.5-inch simple-swap drive bays, up to four 3.5-inch hot-swap SAS/SATA drive bays, or up to four 3.5-inch SATA simple-swap drive bays.
Maximum internal storage	Up to 7.2 TB with 900 GB 2.5-inch SAS HDDs, up to 8 TB with 1 TB 2.5-inch NL SAS/SATA HDDs, up to 6.4 TB with 800 GB 2.5-inch SATA SSDs, or up to 12 TB with 3 TB 3.5-inch NL SAS/SATA HDDs. Intermix of SAS/SATA is supported.
RAID support	RAID 0, 1, and 10 with the C100. RAID 0, 1, and 10 with the H1110, M1115, or optional M5110. Optional upgrade to RAID 5 is available for the C100. Optional upgrade to RAID 5 and 50 is available for the M1115.
Optical drive bays	One, for models with 2.5" drives. Support for optional DVD-ROM or Multiburner.
Tape drive bays	None.
Network interfaces	Up to four integrated Gigabit Ethernet 1000BASE-T RJ-45 ports with the onboard BCM5719 controller (two ports are enabled, and additional two ports require the optional software FoD upgrade to enable them).
I/O expansion slots	Up to two slots, depending on the riser cards installed. The slots are specified: ● Slot 1: PCIe 3.0 x4 (x4-wired); dedicated slot for H1110 ● Slot 2: PCIe 3.0 x8 (x8-wired); full-height, half-length
Ports	Two USB 3.0 ports on the front. Four USB 2.0 ports, one DB-15 video port, one DB-9 serial port, and four RJ-45 GbE network ports on the rear. One internal USB port (for embedded hypervisor).
Cooling	Calibrated Vectored Cooling with five redundant non-hot-swap system fans.

Table 1. Standard specifications (part 2)

Components	Specification
Power supply	Up to two redundant hot-swap 460 W AC power supplies (80 PLUS certification), or one fixed 300 W AC power supply (80 PLUS certification).
Hot-swap parts	Hard drives (model dependent) and power supplies (model dependent).
Systems management	UEFI, Integrated Management Module II (IMM2), basic light path diagnostics, Automatic Server Restart, IBM Systems Director, and ServerGuide. Optional IMM Advanced FoD Upgrade for remote presence (graphics, keyboard and mouse, virtual media).
Security features	Power-on password, administrator's password, and TPM.
Video	Matrox G200eR2 with 16 MB memory integrated into the IMM2. Maximum resolution is 1600x1200 at 75 Hz with 16 M colors.
Operating systems supported	Microsoft Windows Server 2012 R2, 2012, and 2008 R2, RHEL 5 and 6, SLES 11 & 12, VMware vSphere 5.5 (ESXi) and VMware vSphere 5.1 (ESXi).
Limited warranty	Three-year customer-replaceable unit (CRU) and on-site limited warranty with 9x5 next business day (NBD).
Service and support	Optional service upgrades (country-specific) are available through ServicePac® offerings: 4-hour or 2-hour response time, 8 hours fix time, one-year or two-year warranty extension, remote technical support for Lenovo hardware and selected Lenovo and third-party (Microsoft, Linux, VMware) software.
Dimensions	Height: 43 mm (1.7 in.), width: 435 mm (17.1 in.), depth: 576 mm (22.7 in.)
Weight	Minimum configuration: 8.6 kg (19.0 lb), maximum: 12.3 kg (27.1 lb)

The x3250 M5 servers are shipped with the following items:

- Statement of Limited Warranty
- Important Notices
- Rack Installation Instructions
- Documentation CD containing *Installation and User's Guide*
- Rack mount kit (static rails, non-sliding; no cable management arm included)
- One 2.8m, 10A/100-250V, C13 to IEC 320-C14 rack power cable

Standard models

The following table lists the standard models.

Table 2. Standard models

MTM*	Intel processor† (1 maximum)	Memory	RAID	Drive bays (std/ max)	Drives	Onboard NIC (std/max)	I/O slots (std/ max)	Optical drive	Power supply (std/max)
Models announced July 2014									
5458-A3x	1x Pentium G3440 3.3GHz 3MB 1600MHz 2C (53W)	1x 4GB 1600MHz	C100	4x 3.5" SS / 4	Open bay	2x GbE / 4	2 / 2	None	1x 300 W Fixed / 1
5458-C3x	1x Xeon E3-1231 v3 3.4GHz 8MB 1600MHz 4C (80W)	1x 4GB 1600MHz	H1110	4x 3.5" HS / 4	Open bay	2x GbE / 4	2 / 2	None	1x 300 W Fixed / 1
5458-C5x	1x Xeon E3-1231 v3 3.4GHz 8MB 1600MHz 4C (80W)	1x 4GB 1600MHz	C100	4x 2.5" SS / 4	Open bay	2x GbE / 4	2 / 2	Optional	1x 300 W Fixed / 1
5458-F3x	1x Xeon E3-1241 v3 3.5GHz 8MB 1600MHz 4C (80W)	1x 8GB 1600MHz	H1110	4x 2.5" HS / 4	Open bay	2x GbE / 4	2 / 2	Optional	1x 300 W Fixed / 1
5458-F5x	1x Xeon E3-1241 v3 3.5GHz 8MB 1600MHz 4C (80W)	1x 8GB 1600MHz	H1110	4x 2.5" HS / 4	Open bay	2x GbE / 4	2 / 2	Optional	1x 460 W HS / 2
5458-G3x	1x Xeon E3-1271 v3 3.6GHz 8MB 1600MHz 4C (80W)	1x 8GB 1600MHz	M1115	8x 2.5" HS / 8	Open bay	2x GbE / 4	2 / 2	Optional	1x 460 W HS / 2
Models announced October 2013									
5458-A2x	1x Pentium G3420 3.2GHz 3MB 1600MHz 2C (65W)	1x 4GB 1600MHz	C100	4x 3.5" SS / 4	Open bay	2x GbE / 4	2 / 2	None	1x 300 W Fixed / 1
5458-B2x	1x Xeon E3-1220 v3 3.1GHz 8MB 1600MHz 4C (80W)	1x 4GB 1600MHz	C100	4x 3.5" SS / 4	Open bay	2x GbE / 4	2 / 2	None	1x 300 W Fixed / 1
5458-C2x	1x Xeon E3-1230 v3 3.3GHz 8MB 1600MHz 4C (80W)	1x 4GB 1600MHz	H1110	4x 3.5" HS / 4	Open bay	2x GbE / 4	2 / 2	None	1x 300 W Fixed / 1
5458-C4x	1x Xeon E3-1230 v3 3.3GHz 8MB 1600MHz 4C (80W)	1x 8GB 1600MHz	H1110	4x 2.5" HS / 4	Open bay	2x GbE / 4	2 / 2	Optional	1x 300 W Fixed / 1
5458-F2x	1x Xeon E3-1240 v3 3.4GHz 8MB 1600MHz 4C (80W)	1x 8GB 1600MHz	H1110	4x 2.5" HS / 4	Open bay	2x GbE / 4	2 / 2	Optional	1x 460 W HS / 2
5458-G2x	1x Xeon E3-1270 v3 3.5GHz 8MB 1600MHz 4C (80W)	1x 8GB 1600MHz	M1115	8x 2.5" HS / 8	Open bay	2x GbE / 4	2 / 2	Optional	1x 460 W HS / 2

* x in the Machine Type Model (MTM) represents a country-specific letter (for example, the EMEA MTM is 5458-A2G, and the US MTM is 5458-A2U). Ask your local Lenovo or business partner representative for specifics.
† Processor detail: Processor quantity and model, core speed, L3 cache, memory speed, number of cores, TDP.

For information about standard features of the server, see the "Standard specifications" section.

Express models

The following table lists the express models.

Table 3. Express models (Part 1: Models announced July 2014)

MTM*	Intel processor† (1 maximum)	Memory	RAID	Drive bays (std/ max)	Drives	Onboard NIC (std/max)	I/O slots (std/ max	Optical drive	Power supply (std/max)
United States									
5458-EEU	1x Xeon E3-1231 v3 3.4GHz 8MB 1600MHz 4C (80W)	1x 8GB 1600MHz	H1110	4x 3.5" HS / 4	Open bay	2x GbE / 4	2 / 2	None	1x 300 W Fixed / 1
5458-ELU	1x Xeon E3-1271 v3 3.6GHz 8MB 1600MHz 4C (80W)	1x 8GB 1600MHz	M1115	8x 2.5" HS / 8	Open bay	2x GbE / 4	2 / 2	Multiburner	1x 460 W HS / 2
Canada									
5458-ENU	1x Xeon E3-1231 v3 3.4GHz 8MB 1600MHz 4C (80W)	2x 8GB 1600MHz	H1110	4x 2.5" HS / 4	Open bay	2x GbE / 4	2 / 2	Multiburner	2x 460 W HS / 2
Latin America									
5458-EEU	1x Xeon E3-1231 v3 3.4GHz 8MB 1600MHz 4C (80W)	1x 8GB 1600MHz	H1110	4x 3.5" HS / 4	Open bay	2x GbE / 4	2 / 2	None	1x 300 W Fixed / 1
Asia Pacific (Australia only)									
5458-EHM	1x Xeon E3-1231 v3 3.4GHz 8MB 1600MHz 4C (80W)	1x 8GB 1600MHz	C100	4x 3.5" SS / 4	2x 1TB 7.2K	2x GbE / 4	2 / 2	None	1x 300 W Fixed / 1
Asia Pacific (Japan only)									
5458-EPJ	1x Core i3 4150 3.5GHz 3MB 1600MHz 2C (54W)	1x 4GB 1600MHz	C100	4x 3.5" SS / 4	Open bay	2x GbE / 4	2 / 2	None	1x 300 W Fixed / 1
5458-EQJ	1x Xeon E3-1231 v3 3.4GHz 8MB 1600MHz 4C (80W)	1x 4GB 1600MHz	H1110	4x 2.5" HS / 4	Open bay	2x GbE / 4	2 / 2	Optional	1x 460 W HS / 2

* MTM = Machine Type Model

† Processor detail: Processor quantity and model, number of cores, core speed, L3 cache, memory speed, TDP.

Table 3. Express models (Part 1: Models announced July 2014 continued)

MTM*	Intel processor† (1 maximum)	Memory	RAID	Drive bays (std/ max)	Drives	Onboard NIC (std/max)	I/O slots (std/ max	Optical drive	Power supply (std/max)
Europe									
5458-EJG	1x Xeon E3-1241 v3 3.5GHz 8MB 1600MHz 4C (80W)	1x 4GB 1600MHz	H1110	4x 3.5" HS / 4	Open bay	2x GbE / 4	2 / 2	None	1x 300 W Fixed / 1
5458-EKG	1x Xeon E3-1241 v3 3.5GHz 8MB 1600MHz 4C (80W)	1x 4GB 1600MHz	H1110	4x 2.5" HS / 4	Open bay	2x GbE / 4	2 / 2	Multiburner	1x 460 W HS / 2
5458-ELG	1x Xeon E3-1271 v3 3.6GHz 8MB 1600MHz 4C (80W)	1x 8GB 1600MHz	M1115	8x 2.5" HS / 8	Open bay	2x GbE / 4	2 / 2	Multiburner	1x 460 W HS / 2
Central and Eastern Europe (CEE) and Middle East and Africa (MEA)									
5458-EKG	1x Xeon E3-1241 v3 3.5GHz 8MB 1600MHz 4C (80W)	1x 4GB 1600MHz	H1110	4x 2.5" HS / 4	Open bay	2x GbE / 4	2 / 2	Multiburner	1x 460 W HS / 2
5458-ELG	1x Xeon E3-1271 v3 3.6GHz 8MB 1600MHz 4C (80W)	1x 8GB 1600MHz	M1115	8x 2.5" HS / 8	Open bay	2x GbE / 4	2 / 2	Multiburner	1x 460 W HS / 2
Russia/Commonwealth of Independent States (CIS)									
5458-EJG	1x Xeon E3-1241 v3 3.5GHz 8MB 1600MHz 4C (80W)	1x 4GB 1600MHz	H1110	4x 3.5" HS / 4	Open bay	2x GbE / 4	2 / 2	None	1x 300 W Fixed / 1
5458-EKG	1x Xeon E3-1241 v3 3.5GHz 8MB 1600MHz 4C (80W)	1x 4GB 1600MHz	H1110	4x 2.5" HS / 4	Open bay	2x GbE / 4	2 / 2	Multiburner	1x 460 W HS / 2
5458-ELG	1x Xeon E3-1271 v3 3.6GHz 8MB 1600MHz 4C (80W)	1x 8GB 1600MHz	M1115	8x 2.5" HS / 8	Open bay	2x GbE / 4	2 / 2	Multiburner	1x 460 W HS / 2

* MTM = Machine Type Model
† Processor detail: Processor quantity and model, number of cores, core speed, L3 cache, memory speed, TDP.

Table 3. Express models (Part 2: Models announced October 2013)

MTM*	Intel processor† (1 maximum)	Memory	RAID	Drive bays (std/ max)	Drives	Onboard NIC (std/max)	I/O slots (std/ max	Optical drive	Power supply (std/max)
United States									
5458-EAU	1x Xeon E3-1220 v3 3.1GHz 8MB 1600MHz 4C (80W)	1x 8GB 1600MHz	C100	4x 3.5" SS / 4	Open bay	2x GbE / 4	2 / 2	None	1x 300 W Fixed / 1
5458-EBU	1x Xeon E3-1230 v3 3.3GHz 8MB 1600MHz 4C (80W)	1x 8GB 1600MHz	H1110	4x 2.5" HS / 4	Open bay	2x GbE / 4	2 / 2	Multiburner	1x 300 W Fixed / 1
5458-ECU	1x Xeon E3-1240 v3 3.4GHz 8MB 1600MHz 4C (80W)	1x 8GB 1600MHz	H1110	4x 2.5" HS / 4	Open bay	2x GbE / 4	2 / 2	Multiburner	1x 460 W HS / 2
Canada									
5458-EDU	1x Xeon E3-1230 v3 3.3GHz 8MB 1600MHz 4C (80W)	2x 8GB 1600MHz	H1110	4x 2.5" HS / 4	Open bay	2x GbE / 4	2 / 2	Multiburner	2x 460 W HS / 2
Asia Pacific (China only)									
5458-ERC	1x Pentium G3430 3.3GHz 3MB 1600MHz 2C (65W)	1x 4GB 1600MHz	C100	4x 2.5" SS / 4	Open bay	2x GbE / 4	2 / 2	Optional	1x 300 W Fixed / 1
5458-ESC	1x Core-i3 4340 3.6GHz 4MB 1600MHz 2C (65W)	1x 4GB 1600MHz	C100	4x 2.5" SS / 4	Open bay	2x GbE / 4	2 / 2	Optional	1x 300 W Fixed / 1
5458-ETC	1x Xeon E3-1220 v3 3.1GHz 8MB 1600MHz 4C (80W)	1x 4GB 1600MHz	C100	4x 2.5" SS / 4	Open bay	2x GbE / 4	2 / 2	Optional	1x 300 W Fixed / 1
5458-EUC	1x Xeon E3-1240 v3 3.4GHz 8MB 1600MHz 4C (80W)	1x 4GB 1600MHz	H1110	4x 2.5" HS / 4	Open bay	2x GbE / 4	2 / 2	Optional	1x 300 W Fixed / 1
5458-EVC	1x Pentium G3430 3.3GHz 3MB 1600MHz 2C (65W)	1x 4GB 1600MHz	C100	4x 3.5" SS / 4	Open bay	2x GbE / 4	2 / 2	None	1x 300 W Fixed / 1
5458-EWC	1x Xeon E3-1220 v3 3.1GHz 8MB 1600MHz 4C (80W)	1x 4GB 1600MHz	H1110	4x 3.5" HS / 4	Open bay	2x GbE / 4	2 / 2	None	1x 300 W Fixed / 1
5458-EZC	1x Xeon E3-1240 v3 3.4GHz 8MB 1600MHz 4C (80W)	1x 4GB 1600MHz	H1110	4x 3.5" HS / 4	Open bay	2x GbE / 4	2 / 2	None	1x 300 W Fixed / 1
Asia Pacific (Japan only)									
5458-EFJ	1x Core-i3 4340 3.6GHz 4MB 1600MHz 2C (65W)	1x 4GB 1600MHz	C100	4x 3.5" SS / 4	Open bay	2x GbE / 4	2 / 2	None	1x 300 W Fixed / 1
5458-EGJ	1x Xeon E3-1220 v3 3.1GHz 8MB 1600MHz 4C (80W)	1x 4GB 1600MHz	H1110	4x 2.5" HS / 4	Open bay	2x GbE / 4	2 / 2	Optional	1x 460 W HS / 2

* MTM = Machine Type Model
† Processor detail: Processor quantity and model, number of cores, core speed, L3 cache, memory speed, TDP.

Table 3. Express models (Part 2: Models announced October 2013 continued)

MTM*	Intel processor† (1 maximum)	Memory	RAID	Drive bays	Drives	Onboard NIC (std/max)	I/O slots (std/ max	Optical drive	Power supply (std/max)
Europe									
5458-E1G	1x Xeon E3-1220 v3 3.1GHz 8MB 1600MHz 4C (80W)	1x 4GB 1600MHz	C100	4x 3.5" SS / 4	Open bay	2x GbE / 4	2 / 2	None	1x 300 W Fixed / 1
5458-E4G	1x Xeon E3-1220 v3 3.1GHz 8MB 1600MHz 4C (80W)	1x 4GB 1600MHz	H1110	4x 2.5" HS / 4	Open bay	2x GbE / 4	2 / 2	Multiburner	1x 300 W Fixed / 1
5458-E5G	1x Xeon E3-1240 v3 3.4GHz 8MB 1600MHz 4C (80W)	1x 4GB 1600MHz	H1110	4x 2.5" HS / 4	Open bay	2x GbE / 4	2 / 2	Multiburner	1x 460 W HS / 2
5458-E8G	1x Xeon E3-1240 v3 3.4GHz 8MB 1600MHz 4C (80W)	1x 4GB 1600MHz	H1110	4x 3.5" HS / 4	Open bay	2x GbE / 4	2 / 2	None	1x 300 W Fixed / 1
Central and Eastern Europe (CEE) and Middle East and Africa (MEA)									
5458-E2G	1x Xeon E3-1220 v3 3.1GHz 8MB 1600MHz 4C (80W)	1x 4GB 1600MHz	H1110	4x 3.5" SS / 4	2x 2TB SATA	2x GbE / 4	2 / 2	None	1x 300 W Fixed / 1
5458-E4G	1x Xeon E3-1220 v3 3.1GHz 8MB 1600MHz 4C (80W)	1x 4GB 1600MHz	H1110	4x 2.5" HS / 4	Open bay	2x GbE / 4	2 / 2	Multiburner	1x 300 W Fixed / 1
5458-E5G	1x Xeon E3-1240 v3 3.4GHz 8MB 1600MHz 4C (80W)	1x 4GB 1600MHz	H1110	4x 2.5" HS / 4	Open bay	2x GbE / 4	2 / 2	Multiburner	1x 460 W HS / 2
5458-E6G	1x Xeon E3-1270 v3 3.5GHz 8MB 1600MHz 4C (80W)	1x 8GB 1600MHz	M1115	8x 2.5" HS / 8	Open bay	2x GbE / 4	2 / 2	Multiburner	1x 460 W HS / 2

* MTM = Machine Type Model

† Processor detail: Processor quantity and model, number of cores, core speed, L3 cache, memory speed, TDP.

Table 3. Express models (Part 2: Models announced October 2013 continued)

MTM*	Intel processor† (1 maximum)	Memory	RAID	Drive bays	Drives	Onboard NIC (std/max)	I/O slots (std/ max	Optical drive	Power supply (std/max)
Russia/Commonwealth of Independent States (CIS)									
5458-E1G	1x Xeon E3-1220 v3 3.1GHz 8MB 1600MHz 4C (80W)	1x 4GB 1600MHz	C100	4x 3.5" SS / 4	Open bay	2x GbE / 4	2 / 2	None	1x 300 W Fixed / 1
5458-E3G	1x Xeon E3-1240 v3 3.4GHz 8MB 1600MHz 4C (80W)	1x 4GB 1600MHz	C100	4x 3.5" SS / 4	Open bay	2x GbE / 4	2 / 2	None	1x 300 W Fixed / 1
5458-E4G	1x Xeon E3-1220 v3 3.1GHz 8MB 1600MHz 4C (80W)	1x 4GB 1600MHz	H111 0	4x 2.5" HS / 4	Open bay	2x GbE / 4	2 / 2	Multiburner	1x 300 W Fixed / 1
5458-E5G	1x Xeon E3-1240 v3 3.4GHz 8MB 1600MHz 4C (80W)	1x 4GB 1600MHz	H111 0	4x 2.5" HS / 4	Open bay	2x GbE / 4	2 / 2	Multiburner	1x 460 W HS / 2
5458-E6G	1x Xeon E3-1270 v3 3.5GHz 8MB 1600MHz 4C (80W)	1x 8GB 1600MHz	M111 5	8x 2.5" HS / 8	Open bay	2x GbE / 4	2 / 2	Multiburner	1x 460 W HS / 2
5458-E7G	1x Xeon E3-1270 v3 3.5GHz 8MB 1600MHz 4C (80W)	1x 8GB 1600MHz	H111 0	4x 2.5" HS / 4	Open bay	2x GbE / 4	2 / 2	Multiburner	1x 460 W HS / 2
5458-E8G	1x Xeon E3-1240 v3 3.4GHz 8MB 1600MHz 4C (80W)	1x 4GB 1600MHz	H111 0	4x 3.5" HS / 4	Open bay	2x GbE / 4	2 / 2	None	1x 300 W Fixed / 1

* MTM = Machine Type Model
† Processor detail: Processor quantity and model, number of cores, core speed, L3 cache, memory speed, TDP.

Processor options

The x3250 M5 server supports only one processor, which is already installed in all models. No additional processor options are available. The following table lists all processors available in standard models of x3250 M5 or via CTO. If there is no corresponding *where-used* model for a particular processor, that processor is only available through the configure-to-order (CTO) process.

Table 4. Processor options (Part 1)

Feature code*	Description	Standard models where used
Processors announced July 2014		
A5H4	Intel Celeron Processor G1840 2.8GHz 2MB 1333MHz 2C (53W)	
A5UP	Intel Celeron Processor G1840T 2.5GHz 2MB 1333MHz 2C (35W)	-
A5H3	Intel Celeron Processor G1850 2.9GHz 2MB 1333MHz 2C (53W)	-
A5DY	Intel Core i3 Processor 4150 3.5GHz 3MB 1600MHz 2C (54W)	-
A5E4	Intel Core i3 Processor 4150T 3.0GHz 3MB 1600MHz 2C (35W)	-
A5DW	Intel Core i3 Processor 4350 3.6GHz 4MB 1600MHz 2C (54W)	-
A5E3	Intel Core i3 Processor 4350T 3.1GHz 4MB 1600MHz 2C (35W)	-
A5DV	Intel Core i3 Processor 4360 3.7GHz 4MB 1600MHz 2C (54W)	-
A5E1	Intel Pentium Processor G3240 3.1GHz 3MB 1333MHz 2C (53W)	-
A5E5	Intel Pentium Processor G3240T 2.7GHz 3MB 1333MHz 2C (35W)	-
A5E0	Intel Pentium Processor G3440 3.3GHz 3MB 1600MHz 2C (53W)	A3x
A5UN	Intel Pentium Processor G3440T 2.8GHz 3MB 1600MHz 2C (35W)	-
A5DZ	Intel Pentium Processor G3450 3.4GHz 3MB 1600MHz 2C (53W)	-
A5DQ	Intel Xeon Processor E3-1231 v3 3.4GHz 8MB cache 1600MHz 4C (80W)	C3x, C5x
A5DS	Intel Xeon Processor E3-1240L v3 2.0GHz 8MB cache 1600MHz 4C (25W)	-
A5DP	Intel Xeon Processor E3-1241 v3 3.5GHz 8MB cache 1600MHz 4C (80W)	F3x, F5x
A5DN	Intel Xeon Processor E3-1271 v3 3.6GHz 8MB cache 1600MHz 4C (80W)	G3x
A5DR	Intel Xeon Processor E3-1275L v3 2.7GHz 8MB cache 1600MHz 4C (45W)	-
A5DM	Intel Xeon Processor E3-1281 v3 3.7GHz 8MB cache 1600MHz 4C (82W)	-
A5DT	Intel Xeon Processor E3-1286 v3 3.7GHz 8MB cache 1600MHz 4C (84W)	-
A5DU	Intel Xeon Processor E3-1286L v3 3.2GHz 8MB cache 1600MHz 4C (65W)	-

Table 4. Processor options (Part 2)

Feature code*	Description	Standard models where used
Processors announced October 2013		
A4QU	Intel Core i3 Processor 4130 3.4GHz 3MB 1600MHz 2C (54W)	-
A4QW	Intel Core i3 Processor 4130T 2.9GHz 3MB 1600MH 2C (35W)	-
A4QT	Intel Core i3 Processor 4330 3.5GHz 4MB 1600MHz 2C (54W)	-
A4QV	Intel Core i3 Processor 4330T 3.0GHz 4MB 1600MHz 2C (35W)	-
A4QS	Intel Core i3 Processor 4340 3.6GHz 4MB 1600MHz 2C (54W)	-
A4QP	Intel Pentium Processor G3220 3.0 GHz 3MB 1333MHz 2C (54W)	-
A4QR	Intel Pentium Processor G3220T 2.6GHz 3MB 1333MHz 2C (35W)	-
A4K7	Intel Pentium Processor G3420 3.2GHz 3MB 1600MHz 2C (54W)	A2x
A4QQ	Intel Pentium Processor G3420T 2.7GHz 3MB 1600MHz 2C (35W)	-
A4QN	Intel Pentium Processor G3430 3.3 GHz 3MB 1600MHz 2C (54W)	-
A3UB	Intel Xeon Processor E3-1220 v3 3.1GHz 8MB cache 1600MHz 4C (80W)	B2x
A4K6	Intel Xeon Processor E3-1220L v3 1.1GHz 4MB cache 1600MHz 2C (13W)	-
A3UA	Intel Xeon Processor E3-1230 v3 3.3 GHz 8MB cache 1600MHz 4C (80W)	C2x, C4x
A4GL	Intel Xeon Processor E3-1230L v3 1.8GHz 8MB cache 1600MHz 4C (25W)	-
A3U9	Intel Xeon Processor E3-1240 v3 3.4GHz 8MB cache 1600MHz 4C (80W)	F2x
A4GK	Intel Xeon Processor E3-1265L v3 2.5GHz 8MB cache 1600MHz 4C (45W)	-
A3U8	Intel Xeon Processor E3-1270 v3 3.5GHz 8MB cache 1600MHz 4C (80W)	G2x
A3U7	Intel Xeon Processor E3-1280 v3 3.6GHz 8MB cache 1600MHz 4C (82W)	-
A3UC	Intel Xeon Processor E3-1285 v3 3.6GHz 8MB cache 1600MHz 4C (84W)	-
A3UD	Intel Xeon Processor E3-1285L v3 3.1GHz 8MB cache 1600MHz 4C (65W)	-

* No additional processor options are available. The server supports only one processor, which is already included in a standard, CTO, or special bid configuration.

Memory options

Lenovo DDR3 memory is compatibility tested and tuned for optimal System x® performance and throughput. Lenovo memory specifications are integrated into the light path diagnostics panel for immediate system performance feedback and optimum system uptime. From a service and support standpoint, Lenovo memory automatically assumes the system warranty, and Lenovo provides service and support worldwide.

The x3250 M5 server has four DIMM slots, and only DDR3 ECC UDIMMs are supported. The processor has two memory channels, and there are two DIMMs per channel.

The following rules apply when selecting the memory configuration:

- If more than one DIMM is planned to be installed, DIMMs must be installed in a pair, and both DIMMs in a pair must be identical in type and size.
- Intel Xeon processor E3-1200 v3 product family supports up to 1600 MHz memory speeds for one DIMM per channel and two DIMMs per channel configurations provided that the processors support this memory speed.

The x3250 M5 server supports ECC memory protection.

The following table lists the memory options that are available for the x3250 M5 server.

Table 5. Memory options

Part number	Feature code	Description	Maximum supported	Standard models where used
UDIMMs				
00D5012	A3QB	4GB (1x4GB, 2Rx8, 1.35V) PC3L-12800 CL11 ECC DDR3 1600MHz LP UDIMM	4	A2x, A3x, B2x, C2x, C3x, C5x
00D5016	A3QC	8GB (1x8GB, 2Rx8, 1.35V) PC3L-12800 CL11 ECC DDR3 1600MHz LP UDIMM	4	C4x, F2x, F3x, F5x, G2x, G3x

Internal storage

The x3250 M5 server supports the following internal storage configurations:

- Four 2.5-inch small form factor (SFF) SAS/SATA hot-swap drive bays
- Eight 2.5-inch SFF SAS/SATA hot-swap drive bays
- Four 2.5-inch SFF SAS/SATA simple-swap drive bays
- Eight 2.5-inch SFF SAS/SATA simple-swap drive bays
- Four 3.5-inch large form factor (LFF) SAS/SATA hot-swap drive bays
- Four 3.5-inch LFF SATA simple-swap drive bays

Standard models ship with four 2.5-inch SFF SAS/SATA hot-swap, eight 2.5-inch SFF SAS/SATA hot-swap, four 3.5-inch SAS/SATA hot-swap, or four 3.5-inch SATA simple-swap drive bays. The following table shows the internal storage upgrade and expansion options available for the x3250 M5 server.

Table 6. Internal storage expansion options

Part number	Feature code	Description	Maximum supported
46W6577	A4GV	2.5" Simple Swap HDD Hardware RAID upgrade kit	1
46W6576	A4GW	3.5" Simple Swap HDD Hardware RAID upgrade kit	1
00AL348	A4VN	x3250 M5 HS 2.5" HDD 4 to 8 Upgrade Kit	1

Option 46W6577 upgrades standard (see Table 2), Express (see Table 3), or custom (CTO or special bid) models with four 2.5-inch SFF simple-swap drive bays and ServeRAID C100 to hardware RAID models with four or eight SFF simple-swap drive bays. In addition, a supported hardware RAID controller (H1110 for four drive bay models; M1115 or M5110 for four or eight drive bay models) or host bus adapter (HBA) (N2115) is required (not included in the upgrade, it must be purchased separately; see Table 8 for specifics).

Option 46W6576 upgrades standard (see Table 2), Express (see Table 3), or custom (CTO or special bid) models with four 3.5-inch LFF simple-swap drive bays and ServeRAID C100 to hardware RAID models. In addition, a supported hardware RAID controller (H1110, M1115, or M5110) or HBA (N2115) is required (not included in the upgrade, it must be purchased separately).

Option 00AL348 upgrades custom (CTO or special bid) models with four 2.5-inch SFF hot-swap drive bays and hardware RAID controller (M1115 or M5110) or HBA (N2115) to eight 2.5-inch SFF hot-swap drive bays.

H1110 support: Models with four 2.5-inch drive bays and H1110 controller cannot be upgraded to eight drive bays.

Eight drive bays support: Models with 300 W fixed power supply can only support up to four drive bays.

3.5-inch drive bay support: Models with 460 W redundant hot-swap power supplies do not support 3.5-inch drive bays.

An optical drive can be installed internally in models with 2.5-inch hot-swap or simple-swap drive bays (no optical drive support in models with 3.5-inch drive bays).

Controllers for internal storage

The following table lists the internal RAID controllers, HBAs, and the additional options that are used for the internal disk storage of the x3250 M5 server.

Table 7. RAID controllers for internal storage

Part number	Feature code	Description	Maximum supported	Standard models where used
Adapters				
None#	A17T	ServeRAID C100 for System x	1	A2x, B2x
81Y4406	A17U	ServeRAID C100 Series RAID 5 Upgrade for System x-FoD	1	-
81Y4492	A1XL	ServeRAID H1110 SAS/SATA Controller for System x	1	C2x, C4x, F2x
81Y4448	A1MZ	ServeRAID M1115 SAS/SATA Controller for System x	1	G2x
46C8988	A3MW	N2115 SAS/SATA HBA for System x	1	-
ServeRAID M1100 upgrades				
81Y4542	A1X1	ServeRAID M1100 Series Zero Cache/RAID 5 Upgrade	1	-
ServeRAID M5110 upgrades				
81Y4481	A347	ServeRAID M5110 SAS/SATA Controller for System x	1	-
81Y4544	A1X2	ServeRAID M5100 Series Zero Cache/RAID 5 Upgrade	1	-
81Y4484	A1J3	ServeRAID M5100 Series 512MB Cache/RAID 5 Upgrade	1	-
81Y4487	A1J4	ServeRAID M5100 Series 512MB Flash/RAID 5 Upgrade	1	-
81Y4559	A1WY	ServeRAID M5100 Series 1GB Flash/RAID 5 Upgrade	1	-
81Y4508	A22E	ServeRAID M5100 Series Battery Kit for System x	1*	-
81Y4546	A1X3	ServeRAID M5100 Series RAID 6 Upgrade for System x	1†	-
90Y4273	A2MC	ServeRAID M5100 Series Performance Accelerator for System x	1	-
90Y4318	A2MD	ServeRAID M5100 Series SSD Caching Enabler for System x	1	-

The C100 is an onboard ServeRAID controller.
* The ServeRAID M5100 Series Battery Kit (81Y4508) is supported only with ServeRAID M5100 Series 512MB Cache/RAID 5 Upgrade (81Y4484).
† The ServeRAID M5100 Series RAID 6 Upgrade (81Y4546) requires RAID 5 Upgrade with caches (81Y4484, 81Y4487, or 81Y4559).

The C100 is an onboard ServeRAID, and it does not consume a PCIe slot. The H1110 RAID adapter is supported in a dedicated PCIe slot (slot 1). All other hardware RAID adapters and HBAs are supported only in PCIe slot 2.

The following table (Parts 1 and 2) lists drive types and internal drive bay configurations that are supported by the internal RAID controllers and HBAs (SAS HDDs include both SAS and near-line (NL) SAS HDDs, and SATA HDDs include both SATA and NL SATA HDDs).

Table 8. RAID controllers, drive types, and internal drive bays (Part 1: Fixed power supply unit (PSU) models)

RAID controller (Models with fixed power supply)	Drive type	4x 2.5-in. hot-swap	8x 2.5-in. hot-swap	4x 2.5-in. simple-swap	8x 2.5-in. simple-swap	4x 3.5-in. hot-swap	4x 3.5-in. simple-swap
ServeRAID C100	SAS HDD	No support	No support	No support	No support	No support	No support
	SATA HDD	No support	No support	Yes	No support	No support	Yes
	SATA SSD	No support	No support	No support	No support	No support	No support
ServeRAID H1110	SAS HDD	Yes	No support	Yes	No support	Yes	Yes
	SATA HDD	Yes	No support	Yes	No support	Yes	Yes
	SATA SSD	Yes	No support	Yes	No support	No support	No support
ServeRAID M1115	SAS HDD	Yes	No support	Yes	No support	Yes	Yes
	SATA HDD	Yes	No support	Yes	No support	Yes	Yes
	SATA SSD	Yes	No support	Yes	No support	No support	No support
ServeRAID M5110	SAS HDD	Yes	No support	Yes	No support	Yes	Yes
	SATA HDD	Yes	No support	Yes	No support	Yes	Yes
	SATA SSD	Yes	No support	Yes	No support	No support	No support
N2115 HBA	SAS HDD	Yes	No support	Yes	No support	Yes	Yes
	SATA HDD	Yes	No support	Yes	No support	Yes	Yes
	SATA SSD	Yes	No support	Yes	No support	No support	No support

Table 8. RAID controllers, drive types, and internal drive bays (Part 2: Redundant PSU models)

RAID controller (Models with hot-swap power supplies)	Drive type	4x 2.5-in. hot-swap	8x 2.5-in. hot-swap	4x 2.5-in. simple-swap	8x 2.5-in. simple-swap	4x 3.5-in. hot-swap	4x 3.5-in. simple-swap
ServeRAID C100	SAS HDD	No support	No support	No support	No support	No support	No support
	SATA HDD	No support	No support	Yes	No support	No support	No support
	SATA SSD	No support	No support	No support	No support	No support	No support
ServeRAID H1110	SAS HDD	Yes	No support	Yes	No support	No support	No support
	SATA HDD	Yes	No support	Yes	No support	No support	No support
	SATA SSD	Yes	No support	Yes	No support	No support	No support
ServeRAID M1115	SAS HDD	Yes	Yes	Yes	Yes	No support	No support
	SATA HDD	Yes	Yes	Yes	Yes	No support	No support
	SATA SSD	Yes	Yes	Yes	Yes	No support	No support
ServeRAID M5110	SAS HDD	Yes	Yes	Yes	Yes	No support	No support
	SATA HDD	Yes	Yes	Yes	Yes	No support	No support
	SATA SSD	Yes	Yes	Yes	Yes	No support	No support
N2115 HBA	SAS HDD	Yes	Yes	Yes	Yes	No support	No support
	SATA HDD	Yes	Yes	Yes	Yes	No support	No support
	SATA SSD	Yes	Yes	Yes	Yes	No support	No support

The ServeRAID C100 onboard controller has the following specifications:

- Onboard SATA controller with ServeRAID capabilities
- Four internal SATA ports with up to 6 Gbps throughput per port for HDD connectivity
- One internal 3 Gbps SATA port for SATA CD/DVD-ROM connectivity
- Five internal 7-pin L-shape SATA connectors
- Support for RAID levels 0, 1, and 10
- Support for SATA simple-swap hard drives (Solid-state drives and hot-swap drives are not supported.)
- Connection to up to four internal drives
- Support for up to two virtual drives
- Support for virtual drive sizes greater than 2 TB
- Fixed stripe unit size of 64 KB
- Support for MegaRAID Storage Manager management software

The ServeRAID H1110 adapter has the following specifications:

- Four internal 6 Gbps SAS/SATA ports
- One x4 mini-SAS internal connector (SFF-8087)
- Up to 6 Gbps throughput per port
- Based on the LSI SAS2004 6 Gbps RAID on Chip (ROC) controller
- PCIe 2.0 x4 host interface
- Supports RAID 0, 1, 1E, and 10
- Connects to up to four SAS or SATA drives (SAS expanders are not supported.)

The ServeRAID M1115 SAS/SATA Controller has the following specifications:

- Eight internal 6 Gbps SAS/SATA ports
- Two x4 mini-SAS internal connectors (SFF-8087)
- Supports connections to SAS/SATA drives and SAS Expanders
- Supports RAID levels 0, 1, and 10
- Supports RAID levels 5 and 50 with optional M1100 Series RAID 5 upgrades
- Up to 6 Gbps throughput per port
- PCIe 2.0 x8 host interface
- Based on the LSI SAS2008 6 Gbps ROC controller

The ServeRAID M5110 SAS/SATA Controller has the following specifications - hidden DNL:

- Eight internal 6 Gbps SAS/SATA ports
- Two x4 mini-SAS internal connectors (SFF-8087)
- Supports connections to SAS/SATA drives and SAS Expanders
- Supports RAID levels 0, 1, and 10
- Supports RAID levels 5 and 50 with optional M5100 Series RAID 5 upgrades
- Supports RAID levels 6 and 60 with the optional M5100 Series RAID 6 Upgrade
- Supports 512 MB battery-backed cache or 512 MB or 1 GB flash-backed cache
- Support for SSD performance optimization with the optional M5100 Series Performance Accelerator and SSD Caching Enabler
- Up to 6 Gbps throughput per port
- PCIe 3.0 x8 host interface
- Based on the LSI SAS2208 6 Gbps ROC controller

The N2115 SAS/SATA HBA has the following specifications:

- Eight internal 6 Gbps SAS/SATA ports
- Two x4 mini-SAS internal connectors (SFF-8087)
- Supports connections to SAS/SATA HDDs and SATA SSDs
- Optimized for SSD performance
- No RAID support
- Up to 6 Gbps throughput per port
- PCIe 3.0 x8 host interface
- Based on the LSI SAS2308 6 Gbps controller

For more information, see the list of Lenovo Press product guides in the RAID adapters category:
http://www.redbooks.ibm.com/portals/systemx?Open&page=pg&cat=raid

Internal drive options

The following table lists drive options for the internal storage of the x3250 M5 server.

Table 9. Drive options for internal storage (Part 1)

Part number	Feature code	Description	Maximum supported
2.5-inch NL SAS Hot-Swap HDDs			
42D0707	5409	500GB 7200 6Gbps NL SAS 2.5" SFF Slim-HS HDD	8
90Y8953	A2XE	500GB 7.2K 6Gbps NL SAS 2.5" SFF G2HS HDD	8
81Y9690	A1P3	1TB 7.2K 6Gbps NL SAS 2.5" SFF HS HDD	8
2.5-inch NL SATA Hot-Swap HDDs			
81Y9722	A1NX	250GB 7.2K 6Gbps NL SATA 2.5" SFF HS HDD	8
81Y9726	A1NZ	500GB 7.2K 6Gbps NL SATA 2.5" SFF HS HDD	8
81Y9730	A1AV	1TB 7.2K 6Gbps NL SATA 2.5" SFF HS HDD	8
2.5-inch NL SATA Simple-Swap HDDs			
81Y9734	A1NY	250GB 7.2K 6Gbps NL SATA 2.5" SFF SS HDD	8
81Y9738	A1P0	500GB 7.2K 6Gbps NL SATA 2.5" SFF SS HDD	8
81Y9742	A1P2	1TB 7.2K 6Gbps NL SATA 2.5" SFF SS HDD	8
2.5-inch SAS Hot-Swap HDDs			
90Y8926	A2XB	146GB 15K 6Gbps SAS 2.5" SFF G2HS HDD	8
90Y8877	A2XC	300GB 10K 6Gbps SAS 2.5" SFF G2HS HDD	8
81Y9670	A283	300GB 15K 6Gbps SAS 2.5" G2HS HDD	8
90Y8872	A2XD	600GB 10K 6Gbps SAS 2.5" SFF G2HS HDD	8
00AJ300	A4VB	600GB 15K 6Gbps SAS 2.5" G2HS HDD	8
81Y9650	A282	900GB 10K 6Gbps SAS 2.5" SFF HS HDD	8
2.5-inch SAS Hot-Swap self-encrypting drives (SEDs)			
90Y8908	A3EF	600GB 10K 6Gbps SAS 2.5" SFF G2HS SED	8
81Y9662	A3EG	900GB 10K 6Gbps SAS 2.5" SFF G2HS SED	8
2.5-inch SAS Simple-Swap HDDs			
90Y8935	A2ZG	146GB 15K 6Gbps SAS 2.5" SFF G2SS HDD	8
90Y8895	A2ZH	300GB 10K 6Gbps SAS 2.5" SFF G2SS HDD	8
81Y9674	A24J	300GB 15K 6Gbps SAS 2.5" G2SS HDD	8
90Y8890	A2ZJ	600GB 10K 6Gbps SAS 2.5" SFF G2SS HDD	8
81Y9654	A24H	900GB 10K 6Gbps SAS 2.5" SFF SS HDD	8

Table 9. Drive options for internal storage (Part 2)

Part number	Feature code	Description	Maximum supported
2.5-inch SATA Hot-Swap Enterprise Value SSDs			
00AJ355	A56Z	120GB SATA 2.5" MLC HS Enterprise Value SSD	8
00AJ360	A570	240GB SATA 2.5" MLC HS Enterprise Value SSD	8
00AJ365	A571	480GB SATA 2.5" MLC HS Enterprise Value SSD	8
00AJ370	A572	800GB SATA 2.5" MLC HS Enterprise Value SSD	8
00FN268	A5U4	S3500 1.6TB SATA 2.5" MLC HS Enterprise Value SSD	8
2.5-inch SATA Hot-Swap Entry SSDs			
00FN298	AS0D	240GB SATA 2.5" MLC HS Entry SSD	8
00FN327	AS0E	480GB SATA 2.5" MLC HS Entry SSD	8
00FN332	AS0F	960GB SATA 2.5" MLC HS Entry SSD	8
2.5-inch SATA Simple-Swap Enterprise Value SSDs			
00AJ375	A573	120GB SATA 2.5" MLC SS Enterprise Value SSD	8
00AJ380	A574	240GB SATA 2.5" MLC SS Enterprise Value SSD	8
00AJ385	A575	480GB SATA 2.5" MLC SS Enterprise Value SSD	8
00AJ390	A576	800GB SATA 2.5" MLC SS Enterprise Value SSD	8
00FN273	A5U5	S3500 1.6TB SATA 2.5" MLC SS Enterprise Value SSD	8
3.5-inch SAS Hot-Swap HDDs			
49Y6092	A3DV	300GB 15K 6Gbps SAS 3.5" G2HS HDD	4
49Y6097	A3DW	450GB 15K 6Gbps SAS 3.5" G2HS HDD	4
49Y6102	A3DX	600GB 15K 6Gbps SAS 3.5" G2HS HDD	4
3.5-inch NL SATA Hot-Swap HDDs			
81Y9786	A22Y	500GB 7.2K 6Gbps NL SATA 3.5" G2HS HDD	4
81Y9790	A22P	1TB 7.2K 6Gbps NL SATA 3.5" G2HS HDD	4
81Y9794	A22T	2TB 7.2K 6Gbps NL SATA 3.5" G2HS HDD	4
81Y9798	A22S	3TB 7.2K 6Gbps NL SATA 3.5" G2HS HDD	4

Table 9. Drive options for internal storage (Part 3)

Part number	Feature code	Description	Maximum supported
3.5-inch NL SATA Simple-Swap HDDs			
81Y9802	A22U	500GB 7.2K 6Gbps NL SATA 3.5" G2SS HDD	4
81Y9806	A22X	1TB 7.2K 6Gbps NL SATA 3.5" G2SS HDD	4
81Y9810	A22W	2TB 7.2K 6Gbps NL SATA 3.5" G2SS HDD	4
81Y9814	A22V	3TB 7.2K 6Gbps NL SATA 3.5" G2SS HDD	4
3.5-inch NL SATA 512e Advanced Format Hot-Swap HDDs			
00FN113	A5VD	2TB 7.2K 6Gbps NL SATA 3.5" G2HS 512e HDD	4
00FN128	A5VF	3TB 7.2K 6Gbps NL SATA 3.5" G2HS 512e HDD	4
00FN143	A5VH	4TB 7.2K 6Gbps NL SATA 3.5" G2HS 512e HDD	4
00FN158	A5VK	5TB 7.2K 6Gbps NL SATA 3.5" G2HS 512e HDD	4
00FN173	A5VM	6TB 7.2K 6Gbps NL SATA 3.5" G2HS 512e HDD	4
3.5-inch NL SATA 512e Advanced Format Simple-Swap HDDs			
00FN118	A5VE	2TB 7.2K 6Gbps NL SATA 3.5" G2SS 512e HDD	4
00FN133	A5VG	3TB 7.2K 6Gbps NL SATA 3.5" G2SS 512e HDD	4
00FN148	A5VJ	4TB 7.2K 6Gbps NL SATA 3.5" G2SS 512e HDD	4
00FN163	A5VL	5TB 7.2K 6Gbps NL SATA 3.5" G2SS 512e HDD	4
00FN178	A5VN	6TB 7.2K 6Gbps NL SATA 3.5" G2SS 512e HDD	4
3.5-inch NL SAS 512e Advanced Format Hot-Swap HDDs			
00ML203	AS76	2TB 7.2K 6Gbps NL SAS 3.5" G2HS 512e HDD	4
00ML208	AS77	4TB 7.2K 6Gbps NL SAS 3.5" G2HS 512e HDD	4
00ML213	AS78	6TB 7.2K 6Gbps NL SAS 3.5" G2HS 512e HDD	4
3.5-inch NL SAS 512e Advanced Format Hot-Swap SEDs			
00ML218	AS79	2TB 7.2K 6Gbps NL SAS 3.5" G2HS 512e SED	4
00ML223	AS7A	4TB 7.2K 6Gbps NL SAS 3.5" G2HS 512e SED	4
00ML228	AS7B	6TB 7.2K 6Gbps NL SAS 3.5" G2HS 512e SED	4

Internal backup units

The x3250 M5 server does not support internal tape drive options or other internal backup units. However, it can be attached to the external tape drives by using USB, SAS, or Fibre Channel connectivity (see Table 24).

Optical drives

The x3250 M5 server supports the optical drive options listed in the following table. Server models with 3.5-inch HDDs do not support an internal optical drive.

Table 10. Optical drives

Part number	Feature code	Description	Maximum supported	Standard models where used
46M0901	4161	UltraSlim Enhanced SATA DVD-ROM	1	-
46M0902	4163	UltraSlim Enhanced SATA Multi-Burner	1	-

UltraSlim Enhanced SATA DVD-ROM (part number 46M0901) supports the following media and speeds for reading:

- CD-ROM 24X
- CD-R 24X
- CD-RW 24X
- DVD-ROM (4.7 GB) 8X
- DVD-ROM (dual layer, 8.5 GB) 8X
- DVD-R (4.7 GB) 8X
- DVD-R (dual layer, 8.5 GB) 8X
- DVD+R (4.7 GB) 8X
- DVD+R (dual layer, 8.5 GB) 8X
- DVD-RW (4.7 GB) 8X
- DVD+RW (4.7 GB) 8X
- DVD-RAM (4.7 GB) 5X

UltraSlim Enhanced SATA Multi-Burner (46M0902) supports the same media and speeds for reading as DVD-ROM (46M0901). This drive also supports the following media and speeds for writing:

- CD-R 24X
- CD-RW 24X
- DVD-R (4.7 GB) 8X
- DVD-R (dual layer, 8.5 GB) 6X
- DVD+R (4.7 GB) 8X
- DVD+R (dual layer, 8.5 GB) 6X
- DVD-RW (4.7 GB) 6X
- DVD+RW (4.7 GB) 8X
- DVD-RAM (4.7 GB) 5X

I/O expansion options

The x3250 M5 server supports two PCIe slots that come standard with all models. The slot form factors are specified:

- Slot 1: PCIe 3.0 x4 (x4-wired); dedicated slot for the H1110 adapter
- Slot 2: PCIe 3.0 x8 (x8-wired), full-height, half-length

Network adapters

The x3250 M5 supports up to four integrated Gigabit Ethernet 1000BASE-T RJ-45 ports (two enabled standard, and two enabled optionally with the FoD upgrade). One port (Ethernet port 1) is shared between the IMM2 and the operating system.

The integrated network interface controller (NIC) has the following features:

- A Broadcom BCM5719 chip
- Up to four Gigabit Ethernet ports (two enabled standard, and two enabled optionally with the 00AM013 FoD upgrade)
- NIC Teaming (load balancing and failover)

- Ethernet features:
  - Compliant with 1 Gb Ethernet IEEE 802.3, 802.3u, and 802.3ab PHY specifications
  - Integrated PHY for 10/100/1000 Mbps for multispeed, full, and half-duplex auto-negotiation
  - Automatic MDI crossover
  - IEEE 802.3x-compliant flow control support
  - IEEE 1588 protocol and 802.1AS time synchronization implementation
  - IEEE802.3az - Energy Efficient Ethernet (EEE)

- I/O Virtualization features:
  - I/O Virtualization support for VMware NetQueue and Microsoft virtual machine queue (VMQ)
  - Function Level Reset (FLR)
  - IEEE 802.1q Virtual Local Area Network (VLAN) tagging support

- Stateless offload and performance features:
  - TCP, IP, and User Datagram Protocol (UDP) checksum offload
  - TCP segmentation offload (TCO)
  - Large Send Offload (LSO)
  - Receive Side Scaling (RSS) and Transmit Side Scaling (TSS)
  - Message Signal Interrupt (MSI) and Message Signal Interrupt Extension (MSI-X) support
  - Support for jumbo frames up to 9600 bytes

The following table lists additional supported network adapters.

Table 11. Network adapters

Part number	Feature code	Description	Maximum supported
10 Gb Ethernet			
44T1370	A5GZ	Broadcom NetXtreme 2x10GbE BaseT Adapter for System x	1
49Y7910	A18Y	Broadcom NetXtreme II Dual Port 10GBaseT Adapter for System x	1
00JY820	A5UT	Emulex VFA5 2x10 GbE SFP+ PCIe Adapter for System x	1*
00JY830	A5UU	Emulex VFA5 2x10 GbE SFP+ Adapter and FCoE/iSCSI SW for System x	1*
None**	AS3M	Emulex VFA5 2x10 GbE SFP+ Integrated Adapter for System x	1*
00JY824	A5UV	Emulex VFA5 FCoE/iSCSI SW for PCIe Adapter for System x (FoD) (Features on Demand upgrade for 00JY820 and feature AS3M)	1
49Y7960	A2EC	Intel X520-DA2 Dual Port 10GbE SFP+ Adapter for System x	1*
49Y7970	A2ED	Intel X540-T2 Dual Port 10GBaseT Adapter for System x	1
81Y3520	AS73	Intel X710 2x10GbE SFP+ Adapter for System x	1
00D9690	A3PM	Mellanox ConnectX-3 10GbE Adapter for System x	1*
90Y4600	A3MR	QLogic 8200 Dual Port 10GbE SFP+ Virtual Fabric Adapter (VFA) for System x	1*
00Y5624	A3MT	QLogic 8200 VFA FCoE/iSCSI License for System x (FoD) (Features on Demand upgrade for 90Y4600)	1
Integrated NIC Features on Demand (FoD) upgrades			
00AM013	A4K5	Broadcom Ethernet Adapter 5719 - 4 port upgrade	1
Gigabit Ethernet			
90Y9370	A2V4	Broadcom NetXtreme I Dual Port GbE Adapter for System x	1
00AG500	A56K	Intel I350-F1 1xGbE Fiber Adapter for System x	1
00AG510	A56L	Intel I350-T2 2xGbE BaseT Adapter for System x	1
00AG520	A56M	Intel I350-T4 4xGbE BaseT Adapter for System x	1
49Y4230	5767	Intel Ethernet Dual Port Server Adapter I340-T2 for System x	1
49Y4240	5768	Intel Ethernet Quad Port Server Adapter I340-T4 for System x	1
42C1750	2975	PRO/1000 PF Server Adapter by Intel	1

* These adapters require SFP+ optical transceivers or DAC cables that must be purchased separately.
** Configure to order (CTO) only; not available as an option part number

For more information, see the list of Lenovo Press product guides in the Ethernet and IB adapters category:
http://www.redbooks.ibm.com/portals/systemx?Open&page=pg&cat=networkadapters

Storage host bus adapters

The following table lists the storage host bus adapters (HBAs) that are supported by the x3250 M5 server.

Table 12. Storage adapters

Part number	Feature code	Description	Maximum supported
Fibre Channel - 16 Gb			
81Y1675	A2XV	Brocade 16Gb FC Dual-port HBA for System x	1
81Y1668	A2XU	Brocade 16Gb FC Single-port HBA for System x	1
81Y1662	A2W6	Emulex 16Gb FC Dual-port HBA for System x	1
81Y1655	A2W5	Emulex 16Gb FC Single-port HBA for System x	1
Fibre Channel - 8 Gb			
46M6050	3591	Brocade 8Gb FC Dual-port HBA for System x	1
46M6049	3589	Brocade 8Gb FC Single-port HBA for System x	1
42D0494	3581	Emulex 8Gb FC Dual-port HBA for System x	1
42D0485	3580	Emulex 8Gb FC Single-port HBA for System x	1
42D0510	3579	QLogic 8Gb FC Dual-port HBA for System x	1
42D0501	3578	QLogic 8Gb FC Single-port HBA for System x	1
SAS			
46C9010	A3MV	N2125 SAS/SATA HBA for System x	1
00AE912	A5M0	N2225 SAS/SATA HBA for System x	1

For more information, see the list of Lenovo Press product guides in the Host bus adapters category: http://www.redbooks.ibm.com/portals/systemx?Open&page=pg&cat=hba

PCIe SSD adapters

The x3250 M5 server does not support High IOPS SSD adapters.

GPU adapters

The x3250 M5 server does not support graphics processing units (GPUs).

Power supplies

The x3250 M5 server supports one 300 W AC fixed power supply or up to two redundant 460 W hot-swap power supplies. These power supplies are 80 PLUS certified. Standard models come either with one fixed or one hot-swap power supply (model dependent). The following table lists the power supplies. An AC hot-swap power supply option ships standard with one 2.8m, 10A/100-250V, C13 to IEC 320-C14 rack power cable.

Table 13. Power supplies

Part number	Feature code	Description	Maximum supported	Standard models where used
None*	None*	300W Fixed Power Supply Unit	1	A2x, B2x, C2x, C4x
94Y6236	A2E8	460W Redundant Power Supply Unit with 80+ certified	2	F2x, G2x

* Fixed power supply comes either with standard or custom (special bid or CTO) models.

Eight drive bays support: Models with 300 W fixed power supply can only support up to four drive bays.

3.5-inch drive bay support: Models with 460 W redundant hot-swap power supplies do not support 3.5-inch drive bays.

Integrated virtualization

The x3250 M5 server supports VMware ESXi installed on a USB memory key. The key is installed in a USB socket inside the server. The following table lists the virtualization options.

Table 14. Virtualization options

Part number	Feature code	Description	Maximum supported
41Y8298	A2G0	Blank USB Memory Key for VMware ESXi Downloads	1
41Y8382	A4WZ	USB Memory Key for VMware ESXi 5.1 Update 1	1
41Y8385	A584	USB Memory Key for VMware ESXi 5.5	1

Systems management

The server contains Integrated Management Module II (IMM2), which provides advanced service-processor control, monitoring, and an alerting function. If an environmental condition exceeds a threshold or if a system component fails, the IMM2 lights LEDs to help you diagnose the problem, records the error in the event log, and alerts you to the problem. Optionally, the IMM2 also provides a virtual presence capability for remote server management capabilities.

The IMM2 provides remote server management through industry-standard interfaces:

- Intelligent Platform Management Interface (IPMI) Version 2.0
- Simple Network Management Protocol (SNMP) Version 3
- Common Information Model (CIM)
- Web browser

The optional Integrated Management Module Advanced Upgrade is required to enable the remote presence and blue-screen capture features. The remote presence feature provides the following functions:

- Remotely viewing video with graphics resolutions up to 1600x1200 at 75 Hz with up to 23 bits per pixel, regardless of the system state
- Remotely accessing the server using the keyboard and mouse from a remote client
- Mapping the CD or DVD drive, diskette drive, and USB flash drive on a remote client, and mapping ISO and diskette image files as virtual drives that are available for use by the server
- Uploading a diskette image to the IMM memory and mapping it to the server as a virtual drive

The blue-screen capture feature captures the video display contents before the IMM restarts the server when the IMM detects an operating system hang condition. A system administrator can use the blue-screen capture to assist in determining the cause of the hang condition. The following table lists the remote management option.

Table 15. Remote management option

Part number	Feature code	Description	Maximum supported
90Y3901	A1ML	Integrated Management Module Advanced Upgrade	1

For remote management, IMM2 uses Ethernet port 1. Ethernet port 1 is shared between the IMM2 and the operating system.

Thermal option kit

The thermal option kit allows clients to use x3250 M5 servers in environments with the temperature limits extended to 40 degrees C. It also helps lower fan speeds depending on the environment's temperature to lower acoustic noise and energy use. The following table shows ordering information for the thermal kit.

Table 16. Thermal option kit

Part number	Feature code	Description	Maximum supported
00J6351	A3SD	Operating Temperature Enhancement Kit	1

Supported operating systems

The server supports the following operating systems:

- Microsoft Windows Server 2008 R2
- Microsoft Windows Server 2012
- Microsoft Windows Server 2012 R2
- Red Hat Enterprise Linux 5 Server Edition
- Red Hat Enterprise Linux 5 Server with Xen x64 Edition
- Red Hat Enterprise Linux 5 Server x64 Edition
- Red Hat Enterprise Linux 6 Server Edition
- Red Hat Enterprise Linux 6 Server x64 Edition
- Red Hat Enterprise Linux 7
- SUSE LINUX Enterprise Server 11 for AMD64/EM64T
- SUSE LINUX Enterprise Server 11 for x86
- SUSE LINUX Enterprise Server 11 with Xen for AMD64/EM64T
- SUSE Linux Enterprise Server 12
- SUSE Linux Enterprise Server 12 with XEN
- Toshiba 4690 Operating System V6
- VMware vSphere 5.1 (ESXi)
- VMware vSphere 5.5 (ESXi)

For the latest information about the specific versions and service levels that are supported and any other prerequisites, see the ServerProven® website:
http://www.ibm.com/systems/info/x86servers/serverproven/compat/us/nos/matrix.shtml

Physical and electrical specifications

Dimensions and weight (approximate):

- Height: 43 mm (1.7 in.)
- Width: 435 mm (17.1 in.)
- Depth: 576 mm (22.7 in.)
- Maximum weight: 12.3 kg (27.1 lb).

Shipping dimensions and weight (approximate):

- Height: 230 mm (9.1 in.)
- Width: 590 mm (23.2 in.)
- Depth: 1000 mm (39.4 in.)
- Weight (single pack): 12.9 kg (28.4 lb).

Supported environment:

- Air temperature:
  - Server on: 10 °C - 35 °C (50 °F - 95 °F); altitude: 0 - 914 m (3,000 ft).
  - Server on: 10 °C - 32 °C (50 °F - 89.6 °F); altitude: 914 - 2,134 m (7,000 ft).
  - Server off: 10 °C - 43 °C (50 °F - 109.4 °F).
  - Shipment: -40 °C - 60 °C (-40 °F - 140 °F).
- Humidity: 8% - 80%
- Electrical:
  - Models with 460 W redundant hot-swap power supplies:
    - 100 - 127 (nominal) V AC; 50 Hz or 60 Hz; 5.3 A
    - 200 - 240 (nominal) V AC; 50 Hz or 60 Hz; 2.6 A
  - Models with 300 W hot-swap power supplies:
    - 100 - 127 (nominal) V AC; 50 Hz or 60 Hz; 6.0 A
    - 200 - 240 (nominal) V AC; 50 Hz or 60 Hz; 3.0 A
  - Input kilovolt-amperes (kVA) (approximately):
    - Minimum configuration: 0.04 kVA
    - Maximum configuration: 0.50 kVA
- BTU output:
  - Ship configuration: 130 Btu/hr (38 watts)
  - Full configuration: 1720 Btu/hr (504 watts)
- Noise level:
  - 6.5 bels (operating)
  - 6.5 bels (idle)

Warranty options

The x3250 M5 server has a three-year onsite warranty with 9x5/next business day terms. Lenovo offers the warranty service upgrades through ServicePac offerings, described in this section. The ServicePac is a series of prepackaged warranty maintenance upgrades and post-warranty maintenance agreements with a well-defined scope of services, including service hours, response time, term of service, and service agreement terms and conditions.

ServicePac offerings are country-specific; that is, each country might have its own service types, service levels, response times, and terms and conditions. Not all covered types of ServicePac offerings might be available in a particular country. For more information about the ServicePac offerings that are available in your country, visit the ServicePac Product Selector:
https://www-304.ibm.com/sales/gss/download/spst/servicepac

The following table explains warranty service definitions in more detail.

Table 17. Warranty service definitions

Term	Description
On-site repair	A service technician comes to the server's location for equipment repair.
24x7x2 hour	A service technician is scheduled to arrive at your client's location within two hours after remote problem determination is completed. We provide service around the clock, every day, including holidays.
24x7x4 hour	A service technician is scheduled to arrive at your client's location within four hours after remote problem determination is completed. We provide service around the clock, every day, including holidays.
9x5x4 hour	A service technician is scheduled to arrive at your client's location within four business hours after remote problem determination is completed. We provide service from 8:00 a.m. - 5:00 p.m. in the client's local time zone, Monday through Friday, excluding holidays. If it is after 1:00 p.m. and it is determined that onsite service is required, the client can expect the service technician to arrive the morning of the following business day. For noncritical service requests, a service technician will arrive by the end of the following business day.
9x5 next business day	A service technician is scheduled to arrive at your client's location on the business day after we receive your call, following remote problem determination. We provide service from 8:00 a.m. - 5:00 p.m. in the client's local time zone, Monday through Friday, excluding holidays.

In general, the following types of ServicePac offerings are available:

- Warranty and maintenance service upgrades:
  - One, two, three, four, or five years of 9x5 or 24x7 service coverage
  - Onsite repair from 2 or 4 hours to next business day
  - One or two years of warranty extension
- Remote technical support services:
  - One or three years with 24x7 coverage (severity 1) or 9x5/next business day for all severities
  - Installation and startup support for System x servers
  - Remote technical support for System x servers
  - Software support - Support Line:
    - Microsoft or Linux software
    - VMware
    - IBM Systems Director

Regulatory compliance

The server conforms to the following standards:

- Energy Star 2.0
- FCC - Verified to comply with Part 15 of the FCC Rules, Class A
- Canada ICES-003, issue 4, Class A
- UL/IEC 60950-1
- CSA C22.2 No. 60950-1
- NOM-019
- Japan VCCI, Class A
- Australia/New Zealand AS/NZS CISPR 22:2006, Class A
- IEC-60950-1 (CB Certificate and CB Test Report)
- Taiwan BSMI CNS 13438, Class A); CNS 14336
- China CCC (China GB 4943-2001, GB 9254-2008 Class A, GB 17625.1:2003)
- Korea KN22, Class A; KN24
- Russia/GOST ME01, IEC-60950-1, GOST R 51318.22-99, GOST R 51318.24-99, GOST R 51317.3.2-2006, GOST R 51317.3.3-99
- CE Mark (EN55022 Class A, EN60950-1, EN55024, EN61000-3-2, EN61000-3-3)
- CISPR 22, Class A
- TUV-GS (EN60950-1/IEC60950-1,EK1-ITB2000)

External disk storage expansion

The x3250 M5 can be connected to external storage expansion enclosures, such as the EXP2500 series, by using either the ServeRAID M5225 or ServeRAID M5120 SAS/SATA Controllers. The x3250 M5 can also be attached to supported external storage systems by using the supported HBAs listed in Table 12.

The following table provides the ordering part numbers for the ServeRAID controllers.

Table 18. M5120 ordering part numbers and feature codes

Part number	Feature code	Description	Maximum supported
External controllers			
00AE938	A5ND	ServeRAID M5225 SAS/SATA Controller for System x	1
81Y4478	A1WX	ServeRAID M5120 SAS/SATA Controller for System x	1
ServeRAID M5120 upgrades			
81Y4484	A1J3	ServeRAID M5100 Series 512MB Cache/RAID 5 Upgrade for System x	1
81Y4487	A1J4	ServeRAID M5100 Series 512MB Flash/RAID 5 Upgrade for System x	1
81Y4559	A1WY	ServeRAID M5100 Series 1GB Flash/RAID 5 Upgrade for System x	1
81Y4508	A22E	ServeRAID M5100 Series Battery Kit for System x	1
81Y4546	A1X3	ServeRAID M5100 Series RAID 6 Upgrade for System x	1*
90Y4273	A2MC	ServeRAID M5100 Series SSD Performance Accelerator for System x	1*
90Y4318	A2MD	ServeRAID M5100 Series SSD Caching Enabler for System x	1*

* One M5100 Series FoD software license is required per server.

Important: The ServeRAID M5120 SAS/SATA Controller ships standard without a cache. One of the available cache upgrades (81Y4484, 81Y4487, or 81Y4559) is required for the M5120 adapter operations, and it must be purchased together with the controller.

The ServeRAID M5225-2GB SAS/SATA Controller has the following specifications:

- Eight external 12 Gbps SAS/SATA ports
- Two external x4 mini-SAS HD connectors (SFF-8643)
- Supports RAID levels 0, 1, 10, 5, 50 standard
- Optional support for RAID 6 and 60 with the M5200 Series RAID 6 Upgrade
- 2 GB flash-backed cache standard
- PCIe x8 3.0 host interface
- Based on the LSI SAS3108 12 Gbps ROC controller

The ServeRAID M5120 SAS/SATA Controller has the following specifications:

- Eight external 6 Gbps SAS/SATA ports
- Two external x4 mini-SAS connectors (SFF-8088)
- Support for RAID levels 0, 1, and 10
- Support for RAID levels 5 and 50 with optional M5100 Series RAID 5 upgrades
- Support for RAID 6 and 60 with the optional M5100 Series RAID 6 Upgrade
- Support for 512 MB battery-backed cache or 512 MB or 1 GB flash-backed cache
- Up to 6 Gbps throughput per port
- PCIe 3.0 x8 host interface
- Based on the LSI SAS2208 6 Gbps ROC controller
- Support for connectivity to the EXP2512 and EXP2524 storage expansion enclosures

For more information, see the Lenovo Press Product Guide *ServeRAID M5120 SAS/SATA Controller for System x:*
http://www.redbooks.ibm.com/abstracts/tips0858.html?Open

The ServeRAID M5120 SAS/SATA Controller supports connectivity to the external expansion enclosures that are listed in the following table. Up to nine expansion enclosures can be daisy-chained per one M5120 external port. For better performance, distribute expansion enclosures evenly across both M5120 ports.

Table 19. External expansion enclosures

Part number	Description	Maximum quantity supported per one adapter
610012X	EXP2512 Storage Enclosure	17
610024X	EXP2524 Storage Enclosure	9

The external SAS cables that are listed in the following table support connectivity between external expansion enclosures and the ServeRAID M5120 SAS/SATA Controller.

Table 20. External SAS cables for external storage expansion enclosures

Part number	Description	Maximum quantity supported per one enclosure
39R6531	3 m SAS Cable	1
39R6529	1 m SAS Cable	1

The following table lists the drives that are supported by EXP2512 external expansion enclosures.

Table 21. Drive options for EXP2512 external expansion enclosures

Part number	Description	Maximum quantity supported per one enclosure
3.5" NL SAS HS HDDs		
00NC555	2TB 7,200 rpm 6Gb SAS NL 3.5" HDD	12
00NC557	3TB 7,200 rpm 6Gb SAS NL 3.5" HDD	12
00NC559	4TB 7,200 rpm 6Gb SAS NL 3.5" HDD	12

The following table lists the hard disk drives that are supported by EXP2524 external expansion enclosures.

Table 22. Drive options for EXP2524 external expansion enclosures

Part number	Description	Maximum quantity supported per one enclosure
2.5" NL SAS HS HDDs		
00NC571	1TB 7,200 rpm 6Gb SAS NL 2.5" HDD	24
2.5" SAS HS HDDs		
00NC561	146GB 15,000 rpm 6Gb SAS 2.5" HDD	24
00NC563	300GB 15,000 rpm 6Gb SAS 2.5" HDD	24
00NC565	600GB 10,000 rpm 6Gb SAS 2.5" HDD	24
00NC567	900GB 10,000 rpm 6Gb SAS 2.5" HDD	24
00NC569	1.2TB 10,000 rpm 6Gb SAS 2.5" HDD	24
2.5" SAS HS SSDs		
00NC573	200GB 6Gb SAS 2.5" SSD	24
00NC575	400GB 6Gb SAS 2.5" SSD	24

External disk storage systems

The following table lists the external storage systems that are supported by the x3250 M5 server and can be ordered through the System x sales channel. The server might support other disk systems that are not listed in this table. Refer to the IBM System Storage Interoperation Center for further information: http://www.ibm.com/systems/support/storage/ssic

Table 23. External disk storage systems

Part number	Description
2071CU2	IBM Storwize V3500 LFF Dual Control Enclosure
2071CU3	IBM Storwize V3500 SFF Dual Control Enclosure
6099L2C	IBM Storwize V3700 3.5-inch Storage Controller Unit
6099S2C	IBM Storwize V3700 2.5-inch Storage Controller Unit
6099T2C	IBM Storwize V3700 2.5-inch DC Storage Controller Unit
6194L2C	IBM Storwize V5000 LFF Control Enclosure
6194LEU	IBM Storwize V5000 LFF Expansion Enclosure
6194S2C	IBM Storwize V5000 SFF Control Enclosure
6194SEU	IBM Storwize V5000 SFF Expansion Enclosure
6195SC5	IBM Storwize V7000 2.5-inch Storage Controller Unit
6195LEF	IBM Storwize V7000 3.5-inch Storage Expansion Unit
6195SEF	IBM Storwize V7000 2.5-inch Storage Expansion Unit

External backup units

The x3250 M5 server can be attached to the external backup units that are listed in the following table.

Table 24. External backup options

Part number	Description
External tape expansion enclosures for internal tape drives	
87651UX	1U Tape Drive Enclosure
87651NX	1U Tape Drive Enclosure (with Nema 5-15P LineCord)
Tape enclosure adapters (with cables)	
44E8869	USB Enclosure Adapter Kit
40K2599	SAS Enclosure Adapter Kit
Internal backup drives supported by external tape enclosures	
00D2786	RDX Internal USB 3.0 Dock with 320GB Cartridge
00D2787	RDX Internal USB 3.0 Dock with 500GB Cartridge
00D2788	RDX Internal USB 3.0 Dock with 1TB Cartridge
49Y9898	Half High LTO Gen 5 Internal SAS Tape Drive
00D8924	Half High LTO Ultrium Gen 6 Internal SAS Tape Drive
External backup units*	
362532Y	RDX External USB 3.0 Dock with 320GB Cartridge
362550Y	RDX External USB 3.0 Dock with 500GB Cartridge
36251TY	RDX External USB 3.0 Dock with 1TB Cartridge
3628L5X	Half High LTO Gen 5 External SAS Tape Drive (with US line cord)
3628N5X	Half High LTO Gen 5 External SAS Tape Drive (without line cord)

* The external tape drives listed can be ordered through the System x sales channel. The server might support other tape drives that are not listed in this table. Refer to the IBM System Storage Interoperation Center for further information.

For more information, see the list of Lenovo Press product guides in the Backup units category: http://www.redbooks.ibm.com/portals/systemx?Open&page=pg&cat=tape

Top-of-rack Ethernet switches

The x3250 M5 server can be attached to the top-of-rack Ethernet switches from Lenovo that are listed in the following table.

Table 25. Top-of-rack switches

Part number	Description
1 Gb top-of-rack switches	
7309BAX	RackSwitch G7028 (24 ports)
7309CAX	RackSwitch G7028 (48 ports)
0446013	RackSwitch G8000R
7309CFC	RackSwitch G8000F
7309G52	RackSwitch G8052R
730952F	RackSwitch G8052F
10 Gb top-of-rack switches	
7309DRX	RackSwitch G8264CS (Rear to Front)
7309DFX	RackSwitch G8264CS (Front to Rear)
7309BR6	RackSwitch G8124ER
7309BF7	RackSwitch G8124EF
7309G64	RackSwitch G8264R
730964F	RackSwitch G8264F
7309CR9	RackSwitch G8264TR
7309CF9	RackSwitch G8264TF
40 Gb top-of-rack switches	
8036BRX	RackSwitch G8332 (Rear to Front)
8036BFX	RackSwitch G8332 (Front to Rear)
8036ARX	RackSwitch G8316R
8036AFX	RackSwitch G8316F

For more information, see the list of Lenovo Press product guides in the Top-of-rack switches category: http://www.redbooks.ibm.com/portals/systemx?Open&page=pg&cat=tor

Uninterruptible power supply units

The x3250 M5 server can be attached to the uninterruptible power supply units that are listed in the following table.

Table 26. Uninterruptible power supply units (Part 1)

Part number	Description
Tower UPS units	
55951AX	T1kVA Tower UPS (100-125VAC)
55951KX	T1kVA Tower UPS (200-240VAC)
55952AX	T1.5kVA Tower UPS (100-125VAC)
55952KX	T1.5kVA Tower UPS (200-240VAC)
53961AX	1000VA LCD Tower UPS (120V)
53961JX	1000VA LCD Tower UPS (100V)
53961KX	1000VA LCD Tower UPS (230V)
53962AX	1500VA LCD Tower UPS (120V)
53962JX	1500VA LCD Tower UPS (100V)
53962KX	1500VA LCD Tower UPS (230V)
Rack-mounted or tower UPS units	
55941AX	RT1.5kVA 2U Rack or Tower UPS (100-125VAC)
55941KX	RT1.5kVA 2U Rack or Tower UPS (200-240VAC)
55942AX	RT2.2kVA 2U Rack or Tower UPS (100-125VAC)
55942KX	RT2.2kVA 2U Rack or Tower UPS (200-240VAC)
55943AX	RT3kVA 2U Rack or Tower UPS (100-125VAC)
55943KX	RT3kVA 2U Rack or Tower UPS (200-240VAC)
55945KX	RT5kVA 3U Rack or Tower UPS (200-240VAC)
55946KX	RT6kVA 3U Rack or Tower UPS (200-240VAC)
55948KX	RT8kVA 6U Rack or Tower UPS (200-240VAC)
55949KX	RT11kVA 6U Rack or Tower UPS (200-240VAC)
55948PX	RT8kVA 6U 3:1 Phase Rack or Tower UPS (380-415VAC)
55949PX	RT11kVA 6U 3:1 Phase Rack or Tower UPS (380-415VAC)

Table 26. Uninterruptible power supply units (Part 2)

Part number	Description
Rack-mounted UPS units	
53951AX	1500VA LCD 2U Rack UPS (100V/120V)
53951KX	1500VA LCD 2U Rack UPS (230V)
53952AX	2200VA LCD 2U Rack UPS (100V/120V)
53952KX	2200VA LCD 2U Rack UPS (230V)
53953AX	3000VA LCD 3U Rack UPS (100 V/120 V)
53953JX	3000VA LCD 3U Rack UPS (200 V/208 V)
53956AX	6000VA LCD 4U Rack UPS (200 V/208 V)
53956KX	6000VA LCD 4U Rack UPS (230 V)
53959KX	11000VA LCD 5U Rack UPS (200V/208V/230V)
24195KX	UPS5000
21303RX	UPS 7500XHV
21304RX	UPS 10000XHV

For more information, see the list of Lenovo Press product guides in the Power infrastructure category: http://www.redbooks.ibm.com/portals/systemx?Open&page=pg&cat=power

Power distribution units

The x3250 M5 server can be attached to the power distribution units (PDUs) that are listed in the following table.

Table 27. Power distribution units (part 1)

Part number	Description
Switched and Monitored PDUs	
46M4002	1U 9 C19/3 C13 Active Energy Manager DPI PDU
46M4003	1U 9 C19/3 C13 Active Energy Manager 60A 3 Phase PDU
46M4004	1U 12 C13 Active Energy Manager DPI PDU
46M4005	1U 12 C13 Active Energy Manager 60A 3 Phase PDU
46M4167	1U 9 C19/3 C13 Switched and Monitored 30A 3 Phase PDU
46M4116	0U 24 C13 Switched and Monitored 30A PDU
46M4119	0U 24 C13 Switched and Monitored 32A PDU
46M4134	0U 12 C19/12 C13 Switched and Monitored 50A 3 Phase PDU
46M4137	0U 12 C19/12 C13 Switched and Monitored 32A 3 Phase PDU
Enterprise PDUs	
71762MX	Ultra Density Enterprise PDU C19 PDU+ (WW)
71762NX	Ultra Density Enterprise PDU C19 PDU (WW)
71763MU	Ultra Density Enterprise PDU C19 3 Phase 60A PDU+ (NA)
71763NU	Ultra Density Enterprise PDU C19 3 Phase 60A PDU (NA)
39M2816	DPI C13 Enterprise PDU without linecord
39Y8923	DPI 60A Three Phase C19 Enterprise PDU with IEC309 3P+G (208 V) fixed line cord
39Y8941	DPI Single Phase C13 Enterprise PDU without line cord
39Y8948	DPI Single Phase C19 Enterprise PDU without line cord
Front-end PDUs	
39Y8934	DPI 32 amp/250 V Front-end PDU with IEC 309 2P+Gnd connector
39Y8935	DPI 63amp/250 V Front-end PDU with IEC 309 2P+Gnd connector
39Y8938	30 amp/125 V Front-end PDU with NEMA L5-30P connector
39Y8939	30 amp/250 V Front-end PDU with NEMA L6-30P connector
39Y8940	60 amp/250 V Front-end PDU with IEC 309 60A 2P+N+Gnd connector

Table 27. Power distribution units (part 2)

Part number	Description
Universal PDUs	
39Y8951	DPI Universal Rack PDU with US LV and HV line cords
39Y8952	DPI Universal Rack PDU with CEE7-VII Europe LC
39Y8953	DPI Universal Rack PDU with Denmark LC
39Y8954	DPI Universal Rack PDU with Israel LC
39Y8955	DPI Universal Rack PDU with Italy LC
39Y8956	DPI Universal Rack PDU with South Africa LC
39Y8957	DPI Universal Rack PDU with UK LC
39Y8958	DPI Universal Rack PDU with AS/NZ LC
39Y8959	DPI Universal Rack PDU with China LC
39Y8962	DPI Universal Rack PDU (Argentina)
39Y8960	DPI Universal Rack PDU (Brazil)
39Y8961	DPI Universal Rack PDU (India)
0U Basic PDUs	
46M4122	0U 24 C13 16A 3 Phase PDU
46M4125	0U 24 C13 30A 3 Phase PDU
46M4128	0U 24 C13 30A PDU
46M4131	0U 24 C13 32A PDU
46M4140	0U 12 C19/12 C13 60A 3 Phase PDU
46M4143	0U 12 C19/12 C13 32A 3 Phase PDU

For more information, see the list of Lenovo Press product guides in the Power infrastructure category: http://www.redbooks.ibm.com/portals/systemx?Open&page=pg&cat=power

Rack cabinets

The x3250 M5 server can be installed in the rack cabinets that are listed in the following table.

Table 28. Rack cabinets

Part number	Description
201886X	11U Office Enablement Kit
93072RX	25U Standard Rack
93072PX	25U Static S2 Standard Rack
93634EX	42U 1100mm Dynamic Expansion Rack
93634PX	42U 1100mm Dynamic Rack
93604EX	42U 1200mm Deep Dynamic Expansion Rack
93604PX	42U 1200mm Deep Dynamic Rack
93614EX	42U 1200mm Deep Static Expansion Rack
93614PX	42U 1200mm Deep Static Rack
93084EX	42U Enterprise Expansion Rack
93084PX	42U Enterprise Rack
93074RX	42U Standard Rack
93074XX	42U Standard Rack Extension
93624EX	47U 1200mm Deep Static Expansion Rack
93624PX	47U 1200mm Deep Static Rack
93634BX	PureFlex™ System 42U Expansion Rack
93634DX	PureFlex System 42U Expansion Rack
93634AX	PureFlex System 42U Rack
93634CX	PureFlex System 42U Rack
99564XX	S2 42U Dynamic Standard Expansion Rack
99564RX	S2 42U Dynamic Standard Rack

For more information, see the list of Lenovo Press product guides in the Rack cabinets and options category:
http://www.redbooks.ibm.com/portals/systemx?Open&page=pg&cat=rack

Rack options

The x3250 M5 server can be attached to the rack console switches and monitor kits that are listed in the following table.

Table 29. Rack options

Part number	Feature code	Description
Monitor kits and keyboard trays		
17238BX	1723HC1 fc A3EK	1U 18.5" Standard Console
17238EX	1723HC1 fc A3EL	1U 18.5" Enhanced Media Console
172317X	1723HC1 fc 0051	1U 17in Flat Panel Console Kit
172319X	1723HC1 fc 0052	1U 19in Flat Panel Console Kit
Console switches		
3858D3X	3858HC1 fc A4X1	Avocent Universal Management Gateway 6000
1754D2X	1754HC2 fc 6695	Global 4x2x32 Console Manager (GCM32)
1754D1X	1754HC1 fc 6694	Global 2x2x16 Console Manager (GCM16)
1754A2X	1754HC4 fc 0726	Local 2x16 Console Manager (LCM16)
1754A1X	1754HC3 fc 0725	Local 1x8 Console Manager (LCM8)
Console cables		
00AK142	A4X4	UM KVM Module VGA+SD Dual RJ45
43V6147	3757	Single Cable USB Conversion Option (UCO)
39M2895	3756	USB Conversion Option (4 Pack UCO)
39M2897	3754	Long KVM Conversion Option (4 Pack Long KCO)
46M5383	5341	Virtual Media Conversion Option Gen2 (VCO2)
46M5382	5340	Serial Conversion Option (SCO)

For more information, see the list of Lenovo Press product guides in the Rack cabinets and options category:
http://www.redbooks.ibm.com/portals/systemx?Open&page=pg&cat=rack

Related publications and links

For more information, see these resources:

- Lenovo Press product guides for System x servers, switches and options
  http://www.redbooks.ibm.com/portals/systemx?Open&page=pgbycat
- System x3250 M5 product page
  http://www.ibm.com/systems/x/hardware/rack/x3250m5/
- ServerProven hardware compatibility page for the x3250 M5
  http://www.ibm.com/systems/info/x86servers/serverproven/compat/us/xseries/5458.html
- *Configuration and Options Guide*
  http://www.ibm.com/systems/xbc/cog/
- xREF: System x Reference
  http://www.redbooks.ibm.com/xref
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- IBM System Storage Interoperation Center
  http://www.ibm.com/systems/support/storage/ssic

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